PLANNING AND CONSERVATION LEAGUE

Delta Conveyance Size, Cost and Export Comparison

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Attached are the results from several studies of dual conveyance (North and South Delta diversions), all carried out by registered engineers. Costs are in 2010 dollars, like the Bay Delta Conservation Plan costs.

In summary these show that one 3,000 c.f.s intake and tunnel would cost in the neighborhood of $3.8 to $5 billion. Under the current biological opinions this dual conveyance could export on average 640,000 acre feet of water more annually than existing conveyance.

Quintupling (5 times) the number of intakes and size of tunnel(s) would cost $10 to $12 billion and would only provide on average 300,000 acre feet of water more than the 3,000 c.f.s. conveyance.

There are two critical caveats:

The essential information on what flow regimes are necessary to support a healthy Delta ecosystem has not yet been established. The first estimates will come from the State Water Resources Control Board this August.

It is likely that they will show less water available for export under any alternative. Relative to this comparison it is likely that the difference in water exports between a 3,000 c.f.s. conveyance and a 15,000 c.f.s. conveyance will be further reduced.

Second there will be a push for a 6,000 or 9,000 c.f.s conveyance. Irrespective of any other considerations, its potential for future misuse will generate fierce opposition and decades of delay. After the Delta flow needs are established it is possible that a 3,000 c.f.s. conveyance would have significantly reduced opposition.

For more information contact Jonas Minton at jminton@pcl.org 916 719-4049

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1107 9th Street, Suite 360, Sacramento, CA 95814 Phone: 916-444-8726 Fax: 916-448-1789
Website: www.pcl.org Email: pclmail@pcl.org

How does one determine the optimal capacity of an isolated conveyance system for the Delta?

Determination of the optimal size of an isolated facility requires consideration of a wide range of factors that include, but are not limited to:

- Cost
- Water supply delivered (depends on external factors, including hydrology and climate)
- Environmental impacts (aquatic and terrestrial)
- Impacts to other parties (Delta residents and businesses, recreation, other water right holders)
- Institutional hurdles (the ability to implement a solution)
- Time and the opportunity costs of delay

A large capacity facility is expensive; estimated construction costs range from $10 to $12 billion (in 2010 dollars). The mortgage on the facility will be the equivalent cost at midpoint construction, which is estimated from $16 to $20 billion, or about $1.3 billion per year in capital debt payments. Water supply studies have shown that a large conveyance facility will only improve water supplies slightly during dry years and water supplies will continue to decrease with climate change. Yet the facility mortgage must be paid even if water supplies continue to be cut during droughts.

In contrast, a smaller sized facility would be less costly and still provide a significant fraction of the water supply benefit that could be achieved with a larger facility. In addition, a smaller facility will have fewer impacts to other parties, have fewer terrestrial impacts and very likely have fewer institutional hurdles. Such a facility might face less opposition and require less mitigation, including less conversion of prime farmland to habitat. At the same time, a small facility can significantly reduce the pumping in the south Delta to levels that are safe for fisheries while improving overall water deliveries.

With no guarantee that a large facility will provide the level of water supply estimated by planning level studies, a small facility reduces the likelihood of building an asset that becomes non-performing due to unknowns. If necessary, a small facility can be expanded in the future, when it is needed. If 70% of the water supply benefits of a large facility are realized with a small facility that is only half the cost, has fewer impacts, fewer risks and less opposition, it does not make sense to bet the farm on the gamble that a large, expensive facility will work as hoped.

Why doesn't a lot more capacity get a lot more water?

Does more capacity get more water? Yes, just not very much. Why? Conveyance can only move the water that is available. On average, half the water is already taken out of the Sacramento-San Joaquin Delta watershed, with two-thirds of that taken out before it gets to the Delta. Adding a lot more conveyance does very little in dry years; the system is already at the limit with upwards of 75% of the water diverted. In wet years, when the extra capacity could be used, the demand is less (improvements in water use efficiency have reduced irrigation when it is raining). Furthermore, the proposed conveyance on the Sacramento River cannot divert water from the San Joaquin River, nor the rivers on the east side of the Delta, nor water that flows through the Yolo Bypass; nor can it divert the minimum flows required to protect fisheries. With those limitations, the greatest efficiency is achieved with a small capacity system; efficiency drops off rapidly as capacity is increased.

What can be achieved with less capacity?

Studies by the Bay Delta Conservation Plan (BDCP) technical team show that a 10,000 cubic foot per second (cfs) isolated facility gets almost exactly the same amount of new water as a 15,000 cfs facility. That's right: there is no gain in water supply with the cost of going from 10,000 cfs to 15,000 cfs.

BDCP studies also show that a 5,000 cfs isolated facility achieves about 75% of the water supply benefit of a larger 15,000 cfs facility. In fact, increasing the conveyance capacity five times from 3,000 cfs to 15,000 cfs only increases the total water supply by 5%.

Capacity Evaluation

Conveyance Capacity	Water Supply Increase relative to existing conveyance	Water Supply Increase relative to 3,000 cfs capacity
0 cfs	--	--
3,000 cfs	17%	--
5,000 cfs	18%	1%
10,000 cfs	24%	5%
15,000 cfs	24%	5%

What capacity makes sense?

A 3,000 cfs facility has the following advantages:

- Estimated construction cost range from $3.8 to $5 billion, less than 50% of a large facility.
- Water supply: a 3,000 cfs facility gets 70% of the water supply improvement of a 15,000 cfs facility (640 TAF compared to 950 TAF).
- Environmental impacts: the small facility has far fewer impacts that require mitigation.
- Impacts to other parties are greatly reduced or avoided.
- Institutional hurdles are reduced; the threat of "draining the Delta dry" with a 3,000 cfs facility is eliminated.
- Time and opportunity costs: the facility can be on-line faster and the lost water due to current restrictions is eliminated sooner, reducing the lost opportunity costs.
- The facility will be used at capacity most of the time. In contrast, a 15,000 cfs capacity facility would never reach capacity and operate at more than 4,000 cfs less than half the time anyway — a 15,000 cfs facility would be a large, non-performing asset.
- The facility can be easily expanded if that becomes necessary: more intakes and additional pumps can take it to 6,000 cfs easily; adding another tunnel could further increase capacity.
- The facility provides sufficient capacity to protect the California economy in the event of a Delta disaster. Following a disaster, it will take about a year to get the current Delta operating as a water system again. A 3,000 cfs facility will provide an adequate lifeline (2 million acre-feet per year) to supply businesses, industries and communities; this water supply is similar to existing deliveries in a critically dry year. Keep in mind, the likelihood of drought conditions in any year is 30%, much larger than the likelihood of a devastating earthquake in the Delta. Drought is our immediate problem, and that is not solved with a large isolated facility.

Evaluation of a 3,000 cfs Isolated Conveyance Facility

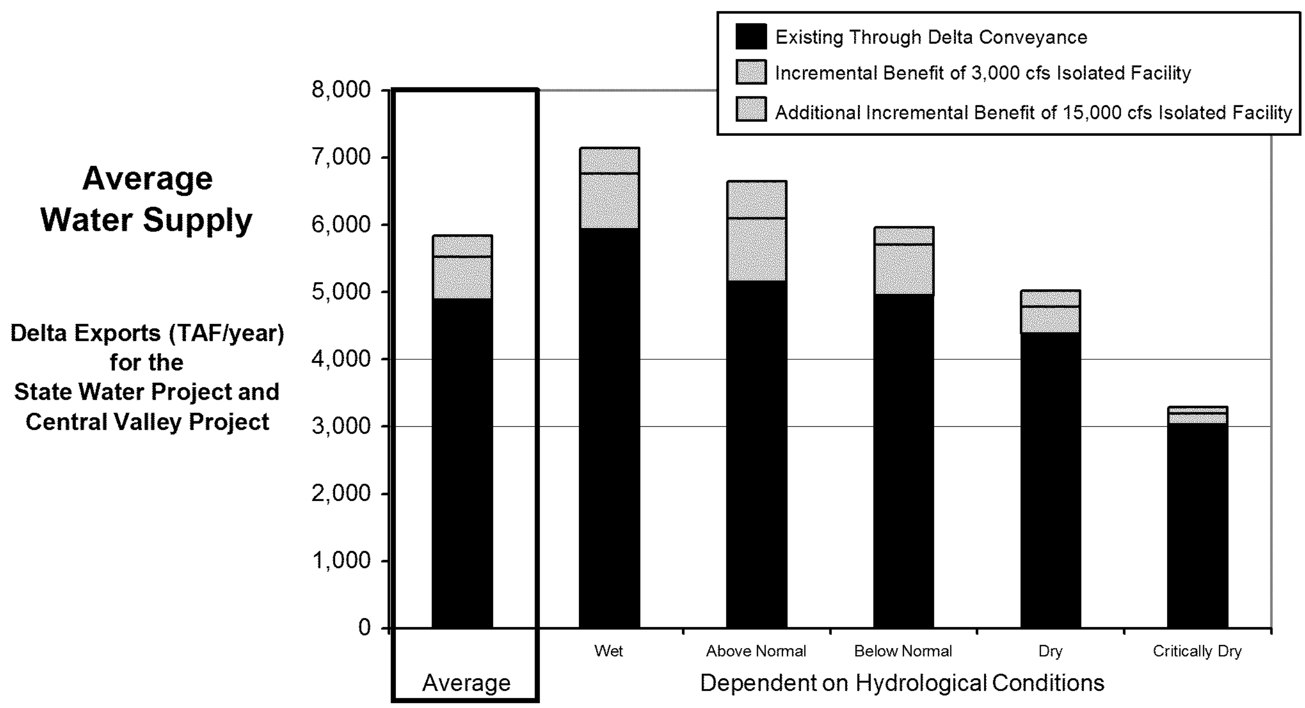
This facts provided in this document are based on current studies for the BDCP and recent modeling:

- Water supply under current conditions is provided by DWR's 2009 State Water Project Delivery Reliability Report (DRR).

- Water supply with a 3,000 cfs capacity and 15,000 cfs capacity facility uses the modeling tools developed for DWR's DRR and assumes the current restrictions of the biological opinions remain. The BDCP anticipates relaxing the current restrictions, but the analysis contained within this document is a more conservative and possibly realistic assumption.

- Cost estimates are based on those provided to the BDCP, using standard engineering methods to scale costs based on capacity reduction from 15,000 cfs to 3,000 cfs. Costs were checked using information on tunneling costs in the following reference: http://www.discovery.org/scripts/viewDB/filesDB-download.php?command=download&id=3591

Incremental Water Supply Benefit of Isolated Conveyance Facilities of Different Capacity



Operational Assumptions:

- Operations of the State Water Project and Central Valley Project rely on assumptions in the modeling tools developed for DWR's 2009 State Water Project Delivery Reliability Report (December 2009) available at: http://baydeltaoffice.water.ca.gov/modeling/hydrology/CalSim/Downloads/CalSimDownloads/CalSim-IIStudies/SWPReliability2009/index.cfm

  - Implements the Reasonable and Prudent Alternatives (RPAs) from the recent biological opinions (2008 FWS BO and 2009 NMFS BO). Although the BDCP is planning to relax some of the RPAs under dual conveyance, the results presented here do not relax the 2008/2009 OCAP BOs.
  - Future Condition (2029)
  - Climate change is not evaluated, but preliminary indications are that all alternatives deliver less water in the future. Thus a large facility will be even less cost effective with time.

- Operation of the Isolated Facility:

  - Bypass flows as defined for the BDCP DRERIP study #1 (December 2008):
    - Minimum bypass flow:
      5,000 cfs July-Aug; 7,000 cfs Sep-Nov; and 11,000 cfs Dec-Jun

    - Additionally for Dec-Jun:
      - 55% of flow greater than minimum during Feb-Apr,
      - 45% of flow greater than minimum during Jan & May,
      - 35% of flow greater than minimum during Dec & Jun

  - Note: BDCP has since developed less restrictive bypass flows

    - Mini-effects analysis (July 2009):
      Using the bypass flow requirements from the "proposed" column of the mini-effects analysis table would increase total exports 5 to 90 TAF/year for a dual conveyance with 3,000 cfs tunnel, relative to the operations we performed. Most of the additional water supply comes in dry and critical years because minimum bypass flow is reduced from 11,000 cfs to 9,000 cfs for Dec-Jun.

    - Current proposed operations (approved by Steering Committee January 2010): The current proposed operations would possibly provide some additional water supply. However, due to the complicated implementation, it is difficult to ascertain if the incremental water supply increase from a 3,000 cfs capacity facility to a 15,000 cfs capacity facility will change much.